

Borehole

52-03-03

Log Event A

Borehole Information

Farm : <u>TY</u>	Tank : <u>TY-103</u>	Site Number : <u>299-W10-95</u>
N-Coord : <u>42,498</u>	W-Coord : <u>75,804</u>	TOC Elevation : <u>671.01</u>
Water Level, ft :	Date Drilled : <u>12/31/1971</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

According to the drilling record, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. The top of the casing, which is the zero reference for the SGLS, is approximately 0.5 ft below the tank farm grade.

Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>03/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>5/14/1996</u>	Logging Engineer: <u>Kim Benham</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>19.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>5/15/1996</u>	Logging Engineer: <u>Gary Lekvold</u>
Start Depth, ft.: <u>99.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>50.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>5/15/1996</u>	Logging Engineer: <u>Gary Lekvold</u>
Start Depth, ft.: <u>51.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>R</u> Shield : <u>N</u>
Finish Depth, ft. : <u>43.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>4</u>	Log Run Date : <u>5/15/1996</u>	Logging Engineer: <u>Gary Lekvold</u>
Start Depth, ft.: <u>44.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>18.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



Spectral Gamma-Ray Borehole
Log Data Report

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Log Event A

Analysis Information

Analyst : E. Larsen

Data Processing Reference : P-GJPO-1787

Analysis Date : 1/31/1997

Analysis Notes :

This borehole was logged by the SGLS in four log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137 and Co-60 were detected in this borehole. The presence of Cs-137 was measured almost continuously from the ground surface to a depth of about 22 ft, and in a continuous zone of very high concentration from 42.5 to 59.5 ft. Scattered occurrences of Cs-137 contamination were detected elsewhere between 29 ft and the bottom of the logged interval (99 ft). The maximum concentration of Cs-137 is unknown because the system became saturated between 45 and 50 ft. Measurable Co-60 concentrations were detected intermittently from 51 to 59.5 ft. The maximum concentration of Co-60 was 0.4 pCi/g at a depth of 58.5 ft.

Between 44 and 50.5 ft, it was not possible to identify any of the 609-keV peaks and most of the 1460- and 2614-keV peaks used to determine the U-238, K-40, and Th-232 concentrations, respectively. Between 45.5 and 49.5 ft, the extremely high gamma-ray activity saturated the detector, making it impossible to detect gamma-ray spectral peaks associated with individual man-made and naturally occurring radionuclides. In the spectra acquired from 44 to 45.5 ft and 49.5 to 50.5 ft, high Cs-137 concentrations created high gamma-ray activity associated with the 662-keV peak. This phenomena produced spectral distortions that prevented the identification of the 609-, 1460-, and 2614-keV peaks.

The K-40 concentration values increase between 45 and 50 ft. The depth at which the K-40 concentration values begin to increase is obscured by the interval of detector saturation. The Th-232 concentrations begin to increase below about 92 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks TY-103 and TY-105.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, in addition to the total gamma derived



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from the spectral data and the Tank Farm gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.